Report on the Flora of Pingelap Atoll, Caroline Islands, Micronesia, and Observations on the Vocabulary of the Native Inhabitants: Pacific Plant Studies 7[1]

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INTRODUCTION

THE SCIENTIFIC literature concerning the botany of the Caroline Islands, Micronesia, is already of considerable extent. It includes check lists and ecological accounts of most of the high islands, a check list of Micronesia, and a floristic treatment of the woody plants. In the Caroline Islands only five island groups contain high islands. These are Palau, Yap, Truk, Ponape, and Kusaie. They have extensive floras, and as is natural, these have received the most intensive botanical investigation.

The atolls and low coral islands are much more numerous in the Carolines than are the high islands. These single coral islands or island clusters are 43 in number. Strange as it appears, no detailed report has been published on the flora of any one of these low islands. During the Christmas period of 1945 the writer led a four-man mission from the University of Hawaii on a 3 weeks' scientific reconnaissance of Micronesia. It was made possible by the courtesy and assistance of the United States Navy, which provided transportation by airplane and ship, and other facilities.

While returning from Kusaie to Ponape on board the navy vessel LCI 567, it was possible to make a brief stop on December 27, 1945, at Pingelap Atoll, which lies about halfway between the two larger islands. It was stormy during the night voyage, and this bad weather delayed the landfall from dawn to midmorning. The sky was murky and one rain squall after another drove across the sea, greatly reducing visibility. Nevertheless, the miraculous radar enabled the navigators to pick up and locate the island and approach with assurance, till it loomed up a mile ahead as a low dark line on the gray sea. Circling the south end the vessel approached and lay to off the western shore of the larger and southernmost islet, Pingelap Island, just opposite the single village.

Ready and eager to get ashore, the writer climbed down a rope ladder and dropped into the first boat to come alongside. It was a trim and slim two-man outrigger canoe. It was large enough so that even with an extra passenger there were still several inches of freeboard, and the trip to the shore was made without bailing. The reef was a shelving one, extending far out, but submerged enough so that the canoe easily floated all the way to the beach. Of the two paddlers, the one in charge was a sturdy, elderly, white-haired man named Soăs. Both were eager for the cigarettes offered them, but the driving rain prevented their being lighted.

Our ship was the second to visit the island in 4 years. Three months before, a United States Navy ship had repatriated some seventy-five of the men who had been working for the Japanese armed forces as forced agricultural laborers on the plantations on Ponape. They returned in want of new clothing and goods, to find their families and neighbors in similar need. Many men, women, and youths had for clothes only a few ragged bits of cloth. The most needy were clothed in girdles of leaves. Soăs appeared with

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ragged shorts partly covered by a skirt of leaves, but later he changed to a better garment.

As the little canoe grounded on the beach, a host of people advanced. It seemed as if an interminable function of handshaking was imminent, but it was possible to limit it to a few of the elders. A chief controlled them and lined them up. The group of some two hundred sang a hearty song of welcome. It was a warm and a stirring reception. Lest the impression be gained that the reception was a great personal triumph, it should be made clear that curiosity was enough to bring many to the beach, and the hope that the stranger landing on the beach was a trader bringing cloth, thread, knives, and other goods, was a strong motive to bring out the people. Unfortunately, the few articles, knives, cloth, chewing gum, and cigarettes, carried by the botanist were only enough for the guide and his family.

The village (see map, Fig. 1) stretched along a single straight street starting from the bombed church at the south end and running northward parallel with the west beach. Most of the homes were frame structures, but a number were of thatch, as were all the outbuildings. Fruit trees and ornamental shrubs and herbs were numerous in the village, which was well kept and attractive. Not many other food plants were cultivated in the village. Fecundity of the people was evident, for small children appeared in swarms, and had to be carefully dodged when one walked in the village.

East of the north end of the village and about midway across the island was a large swampy depression, at least 300 feet wide and 600 feet long. This had been converted into a "lepuel" or wet garden. Each family controlled a lot in it, for wet-land agriculture. At a glance it appeared to be a solid growth of *Cyrtosperma Chamissonis,* the most important starchy food crop. The plants were of fair size in the black, wet muck, reaching about 8 feet in height. These were not more than 2 years old. If allowed to grow to maturity at 3 years, they more than double in height, and produce an enormous corm. Soăs said that the largest corms were 2 feet in diameter and 5 feet long and so heavy that two men were needed to carry one. Infrequent in the patch were plants of *Colocasia esculenta, Musa paradisiaca,* and *Saccharum officinarum.*

The whole island was wooded. Native plants were not rare, but the forest stand was of *Cocos nucifera,* which had been planted to produce copra for trade with foreigners. These coconut trees made an even canopy which, at 75 feet, dominated the scene.

Second in importance as a starchy food was *Tacca Leontopetaloides,* called "mŭgamuk." This was stated to be planted in garden patches. It also occurred widespread throughout the coconut plantation, where it was self-sown. From small tubers it persisted and apparently it spread also by seed, which may have been broadcast. It was certainly not indigenous, and did not grow on the top of the beaches or in any close proximity to them.

The shallow margin of the lagoon was noteworthy, for there were several large patches of mangroves, both *Rhizophora mucronata* and *Sonneratia alba.*

PINGELAP LANGUAGE

No published or other record has been found of any compilation or study of the Pingelap language. One would expect it to be similar to the tongues spoken on either one of the adjacent large islands, Kusaie or Ponape.

The writer's boatman, named Soăs, spoke a little English, so he became guide and informant during the brief but vigorous exploration of Pingelap Island. Even without an interpreter or a common language, it is possible to obtain the native names of plants from a good informant. The writer has succeeded in doing so on numerous Pacific islands. Soăs furnished the names for every plant collected and for others merely observed. The crowds of bystanders were asked, and they confirmed many of the names Soăs sup-

plied. As is characteristic among unspoiled Polynesians, Melanesians, and Micronesians, from childhood on, every person knows the name and uses of essentially every plant in the flora. For several of the plants information was obtained as to their economic or ethnic uses. For some of the economic or crop plants, such as *Cyrtosperma, Colocasia,* and *Pandanus,* this information was extensive and detailed. The natives recognize, name, and keep distinct numerous cultivated varieties. Names for these varieties, as well as for the species themselves, were obtained. Together, they make a total of 80 names, and as examples of the Pingelap language have some importance. Each one has been studied to determine whether it appears in identical or modified form as a descriptive word or phrase in the languages of the Marshalls, Kusaie, Ponape, or Truk. Surprisingly, this study shows little in common with any of these languages, and the few identities seem mere coincidences. For instance, "mesawsŏl" is a cultivated variety of *Colocasia* in Pingelap, while in Kusaie the word "meza-oual" (Lesson, 1839:516) means the last quarter of the moon. Some community of significance is possible but seems improbable. This was the only word that seemed to suggest an identity.

ALPHABET

The plant names were recorded as heard. No preconceived theory of the language was used or convention adopted that one letter should represent several different sounds. The words were written down as they sounded to an American. No difficulty was experienced in recording the consonants, but a little was with the vowels. As indicated in the following table, vowels without any mark represent a long vowel, while the short vowels were marked, as in ă.

Vowels used in Recording of Pingelap Vocabulary

a—as *a* in f*a*ther
ă—as *a* in h*a*t
e—as *a* in s*a*y
ĕ—as *e* in b*e*t
i—as *ee* in k*ee*p
ĭ—as *i* in b*i*t
o—as *o* in sn*o*w
ŏ—as *o* in p*o*p
u—as *u* in r*u*le
ŭ—as *u* in d*u*ck

ETHNOBOTANY

The flora of Pingelap Island, as here recorded, includes 57 species, falling into the following groups:

Indigenous	32
Crop plant and cultivated or introduced economic trees	12
Ornamentals	10
Adventive weeds	3
Total	57

Of the 57 Pingelap plants all but five are now known to occur on the Marshall Islands. The ones lacking are nos. 19, 21, 23, 26, and 29 of the list which follows. Though the Marshalls lie some distance to the east, the nearest, Ujelang Atoll, being 243 miles to the north, and the most remote, Pokaakku, being 805 miles away, still they are all atolls or coral islands, and, as is well known, have a flora mostly of wide-ranging species.

Of the 57 Pingelap plants, 42 are also known on Kusaie. The species missing there are nos. 8, 10, 12, 17, 21, 23, 26, 28, 32, 43, 44, 45, 48, 50, and 52. Four of these are cultivated ornamentals, and one an introduced weed, so their absence is not significant. Then, too, the flora of Kusaie is not as completely known as that of some of the other Caroline Islands.

Of the 57 Pingelap plants, 41 are also known on Ponape. The species missing are nos. 8, 10, 12, 16, 17, 19, 23, 25, 26, 27, 28, 32, 34, 45, 48, and 50. These include three cultivated ornamentals and one introduced weed.

Of the 57 Pingelap plants, 46 are also known on Truk. The species missing are nos. 6, 7, 8, 17, 24, 25, 26, 27, 36, 48, and 52. These include two cultivated ornamentals and three weeds.

It is quite possible that more intensive exploration and collecting on Kusaie and Ponape will

reveal the existence of some of these species, reducing the list of the missing ones.

Some of the plants of Pingelap Atoll have vernacular names that are unique and local. Other plants, common to several of the islands, have names that are identical or so similar that they are doubtless linguistic variants. These are distinguished by *italic* type in the tabulation that follows.

Names preceded by an asterisk were recorded in the field by the writer. The others are compiled from sources listed in the bibliography. Those names were obtained over a span of more than a century and were recorded by French, German, Japanese, and American explorers who all used their own orthography, yet the homology of their rendering of the vernacular names is striking and significant.

TABLE OF VERNACULAR NAMES ON PINGELAP AND ADJACENT ISLANDS

PLANT SPECIES	ISLANDS AND LIST OF VERNACULAR PLANT NAMES				
	Pingelap	Ponape	Truk	Kusaie	Marshall Is.
Asplenium nidus	*seilĭk		ngok, nuk, nük	moilukluk, *mueyliklik	*kartep, karatup, ardap
Nephrolepis biserrata	*puĕs	rawtil	emĕre, amäre		*bairik
Polypodium Phymatodes	*kĭteu	*kiteu, kitiu, kitheu, kĕtáu*	onnum, chichi, chiji, sichôn	kemkem, kilm, klim	*kino, *kwino
Vittaria elongata	*lĭt				*wujoĕt
Pandanus sp.	*kipai	*kipar, kipal,* táip	*kepār,* fadj, fach	me-ale, *muang	*bop, böb
Thalassia Hemprichii	*walăt	*olŏt*			*wujoĕt in loidjit
Eragrostis amabilis	*rosakai				*wujoĕt, *wujoïch, *wujuĕs, *ujoĕt, *ujoich, ujos
Lepturus repens	*rosakai				*wujoĕt, *wujoïch bugur, *wujuĕs, *ujoĕt, *ujoïch, ujoj, ujuj
Saccharum officinarum	*seu	*tšéu, wou*	*wou, uou*	*taoh, ta	*to, *dau
Thuarea involuta	*mokarăk		unnôm, unôm		*wujoĕt, *wujoïch, *wujuĕs, *uyoĕt, *ujoĕt, *ujoïch, *ujŏtch, ujuj, ujos maroro, *kakŭmkŭm
Cyperus javanicus	*săpasăp	use	nikaünoün, ämänä, moirer		*sapasap,* *ujoĕt, *wujoĕt, *wujoĕt in ion buil

FIG. 2. Natives at landing, east side of Pingelap Island. The village is just within the coconut grove.
PHOTO BY H. I. FISHER.

FIG. 3. South end of lagoon, showing seedlings and forest of mangrove, *Rhizophora mucronata.*
PHOTO BY H. ST. JOHN.

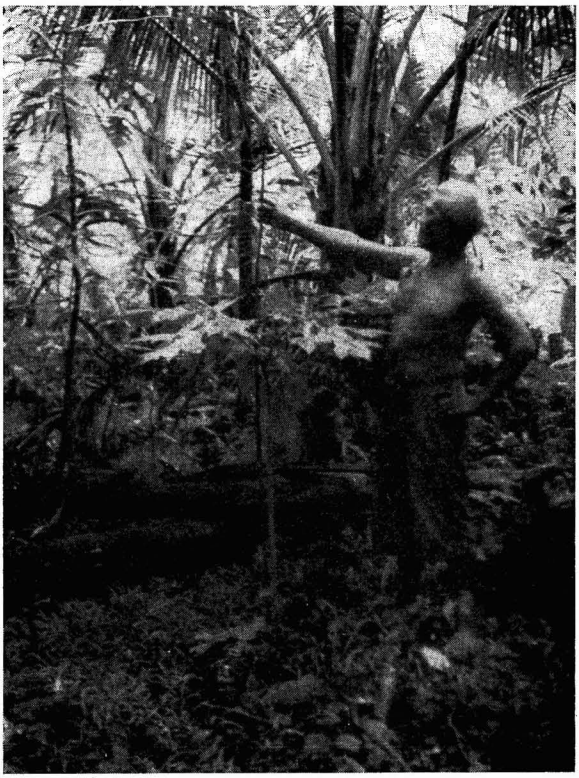

FIG. 4. Guide Soăs holding penduncle, and standing breast high to the leaf of the starchy vegetable *Tacca Leontopetaloides* or "mŭgamuk."

PHOTO BY H. ST. JOHN.

FIG. 5. Wet-land garden or "lepuel" of *Cyrtosperma Chamissonis* or "Muiăng."
PHOTO BY H. ST. JOHN.

FIG. 6. Village street on Pingelap Island, showing plants, from the left, *Pandanus* sp. or "kipai"; *Nephrolepis biserrata* or "puĕs"; *Carica Papaya* or "kaineăp"; and *Cocos nucifera* or "ni." PHOTO BY H. ST. JOHN.

FIG. 7. Family of natives, showing the guide Soăs (man at right) and his relatives. PHOTO BY H. ST. JOHN.

FIG. 8. Natives on village street. PHOTO BY H. I. FISHER.

FIG. 9. Natives on beach at landing. PHOTO BY H. I. FISHER.

TABLE OF VERNACULAR NAMES ON PINGELAP AND ADJACENT ISLANDS (*Continued*)

PLANT SPECIES	ISLANDS AND LIST OF VERNACULAR PLANT NAMES				
	Pingelap	Ponape	Truk	Kusaie	Marshall Is.
Fimbristylis cymosa	*rosakai		fedil, puker		*berelĭtchman, *pĕrĕrlĭtchman, perelejman, perijman, berejisman, *dilĭtchman, *drelĭsman, *drelĭtchman, *merelĭjiman, *malelĭtchmar, *uioĕt
Cocos nucifera	**ni*	*ni*	*nu*	**nu* (drinking nut), *nou, kwanu, *kuenu*	**ni*
Colocasia esculenta var. antiquorum	**sawa*	*sawa, tšaua*	*sawa*, sarawai, onni	*katak, taka	*katak
Cyrtosperma Chamissonis	**muiăng*	*mwong*	pashön, fanan, pula	*pashok	*iarătz, *iarătch, iaraj
C. Chamissonis var.	**muiăng an Ngatik*	*mwang en Natik*			
C. Chamissonis var.	**sĭmidĭn*		*simiten*	**simenton*	
Crinum asiaticum	**kiĕp*		*kiop, kiaup, kip*, sip		**kiĕp, *guiĕp, gib*
Zephyranthes rosea	*kiĕp				
Tacca Leontopetaloides	**mŭgamuk*	*mokomok, mokamok, mokimok*	*mokomok, mokumok, makmok, mokemok*	**mokmok*	**magamŭk, *magamok, *makamuk, makmok, mokmok, mokemok, mokamok*
Dioscorea sp.	**kep*	*kep*, kaapwalap	*ep*, ampul	*ohkani	*mata
Musa paradisiaca	*wis (on Woleai I. called: *wiss*)	oio, ūt	uch, udj	*ousch, eusr, oune	*kebrang, kebreng, kabrang, kabiran, *binana (=banana)
M. paradisiaca var.	**Taiwan*		*taiwang*	**Taiwan banana*	
M. paradisiaca var.	**Amerika*		*Amerika*		
M. paradisiaca var.	**lakatăn*		*nakatan*	**lakatan*	

TABLE OF VERNACULAR NAMES ON PINGELAP AND ADJACENT ISLANDS (*Continued*)

PLANT SPECIES	ISLANDS AND LIST OF VERNACULAR PLANT NAMES				
	Pingelap	Ponape	Truk	Kusaie	Marshall Is.
Peperomia ponapensis	*warĭn				(*P.* spp.) rebijrege, *rabitchidraga
Artocarpus incisus	**mai*	*mai, mäi*	*mai*	*mos, mosse, mo-us, mohs	**me, ma*
A. incisus var.	**me pa*	*mei pa*	*me pwo*	*meipa*	
A. incisus var.	**me si*	*méi šē*		*me si*	
Ficus sp.	**kawain*	neen, nin	*awan, auon, aüwön, aoan,* au	shra, *konyah	*tebero, tepero
Pilea microphylla	*re				tabalok
Pipturus argenteus	**oroma*		*aromë* (on Nomwin I.; Hall Is. called: *aroma*)	alko	*arame, *arme, *armai
Ceodes umbellifera	*mas				
Mirabilis Jalapa	*pesikulŏk				*emenawa, *emen aur, *emmen aur, *ulitch, ulij
Bryophyllum pinnatum	*lămalăm				
Derris trifoliata	*kainipĭl	kan arai	unenipot, up		
Vigna marina	*nimĕlitŏp		wönüka		*margnĕjojo, *margonejojo, *margonejoyo, markinichojo, marlap, chojo
Acalypha grandis var. **genuina**	*kurulŏng	mánau	manou, mönou		wut
Euphorbia Atoto	**pĕlepĕl*				*buŭlbuŭl, *buŭlibuŭlikar, *berrŭl, *berŏl, perul, *berau, *perau, *peiralo
Phyllanthus Niruri	**limaimeir*	*limairpwong*	negamaur, nikammöür, amoesis		mar kaueue (nameless on most islands)
Allophylus timorensis	**kĭtăk*		ngo		*kitäk, *kŭtăk, *kudăk, *kutăl

TABLE OF VERNACULAR NAMES ON PINGELAP AND ADJACENT ISLANDS (*Continued*)

PLANT SPECIES	ISLANDS AND LIST OF VERNACULAR PLANT NAMES				
	Pingelap	Ponape	Truk	Kusaie	Marshall Is.
Triumfetta procumbens	*konŏp		kiuin, kun, liodot		*ădăt, *adat, *atat, hatat, *hadat
Sida fallax	*kao		síoi lë		*kio, *keo, *guio
Thespesia populnea	*pĕnne	pone, pōna	pono, pönö, pona, pollo, böllë, okuran, likokon	*banoh, pakeena	
Calophyllum Inophyllum	*sepang	isyo, luāk, itšau	ijau, legitu, regits, rekich, rakich, rekit, wangu, mosur	itu, eet, *etuh	luech, luej, *luĕt, *luĕs, *luguĕz, *luguĕtz
Carica Papaya	*kaineăp	mŏmiăp	kippwau, kipau, kipuau	*es	*keinapu, *keinabu, keinabbu, kinapu, kenabu, keinapu, *geinapu
Pemphis acidula	*ka-i-ni	ngi	engi	kasugel	*kungi, *gungi, kinik
Sonneratia alba	*kosa	koto, kawtaw, kwat	saras, salas, sales, taras	folofol, flofol	eroeak
Barringtonia asiatica	*wi	wi, uī	kun, gun, guon, azan	kaénal, *pospus, poasi-poasi	*wup, *wuep, wop, *ob
Rhizophora mucronata	*ăk	ak, aak	ak, addo, chia, tia		
Terminalia Catappa	*tepŏp	tipāp, thipāp, thipwopu	as, asas	sarf	*kodel, kotal, kutil
Terminalia litoralis	*wĭn	sin	sin		kiking, *kugung, kukung, *kung, *ekkung, ekun
Jussiaea suffruticosa var. **ligustrifolia**	*kuri	teleurak, deleurak	likeinenpul, aunenipuin, aünenipwin, nigaulen		nen kut a kut
Plumeria acutifolia	*po maria (=Plumeria)		söür		*meria, *mei ria (=Plumeria)

TABLE OF VERNACULAR NAMES ON PINGELAP AND ADJACENT ISLANDS (*Continued*)

PLANT SPECIES	ISLANDS AND LIST OF VERNACULAR PLANT NAMES				
	Pingelap	Ponape	Truk	Kusaie	Marshall Is.
Asclepias curassavica	*kimeme				*kepŏk (=kapok), *ialu (=yellow)
Messerschmidia argentea	**sĕsĕn*	*titĭn*	ëmoloset, amaloset, amoneset, chen	*sasran, *shawshon*	*krin, kirin, *kurin, *girin, kidrin
Clerodendrum inerme	**ilau*	*ilaw*	*ulo,* apuech, apuoch, apwöch, etiu, pucherik		*wuletch, *wules, ulij
Premna integrifolia	**sokŭk*	*topuk, tŭpŭk,* awr	lior, niôr, umukau, umukaü	*fienket, fiankig	*kar, *gar
Pseuderanthemum atropurpureum	*sarinairăm			kaiwak	*jemla wulues
Guettarda speciosa	*elĕs	ith	mosor		*wudilonaro, *wutilumar, *wutilomar, *wudilomar, *wudinakatche, wut
Ixora carolinensis	**kalesu*	katiu	atiu, achiu, achen	*galusa,* kalcé	**kajiru, *gajiru*
Morinda citrifolia	**obul*	*'umpūl, woipel, weipul,* kirikéi	*nobur, nopur,* alin, arin, nën	*ee, e, hi	*nin, nen
Scaevola frutescens	**raměk* (on Woleai Is., called: *ramakaa*)	*ramuk, inuk,* enat	not, nat, amáloset	kusros	*kŭnnat, *kunnăt, *gunnat, konnat, *kennat, ka-na-ta, *kanun, mar kinat
Wedelia biflora	*kĭsuwĕll	ngkau	atiwöt, atuat, atuot, ëadiat	agaia, *ekeh	*morijetch, *marijetch, *marjatch, marajej, morigides, *markibuebue, *margkiwewe, *margiwewe, markueue, *buĭlibuĭli-kăth

COMPARISON OF VERNACULAR PLANT NAMES

Analysis of these tabulations seems to reveal the linguistic affinities of Pingelap.

Kusaie is the closest high island, being only 166 nautical miles to the southeast by east. Actually, there is one other small island, Mokil, situated 60 miles northwest by west, but nothing is known of its flora, the people, or their language. Also, Ponape is situated 168 miles northwest by west from Pingelap, so it is not much farther away than Kusaie.

Plants with Similar Names on Kusaie and Pingelap

8 cultivated food crops
1 timber tree, probably cultivated
1 indigenous tree
1 cultivated ornamental shrub
1 indigenous

12 total (out of the 42 species in common)

Degree of Similarity: Four, or 33.3 per cent, with identical names. These are all cultivated food plants. Eight, or 66.6 per cent, with altered names. All, or 100 per cent, are much modified.

The Marshall Islands are remote, at least 243 nautical miles away, but are similar coral islands. They include in their flora 52 of the species, that is, all but five of the Pingelap plants.

Plants with Similar Names on the Marshall Islands and Pingelap

5 cultivated food plants
3 cultivated ornamentals
2 perhaps cultivated, perhaps indigenous
3 indigenous

13 total (out of the 52 species in common)

Degree of Similarity: Four, or 30 per cent, with identical names. These contain 1 cultivated food plant, 1 cultivated ornamental, 1 sedge cultivated or native, and 1 indigenous tree. Nine, or 70 per cent, with altered names. Of these, 3 (or 23 per cent) are much modified.

Truk, situated 600 miles to the west, is a group with several volcanic islands in a lagoon surrounded by an atoll ring with coral islets.

Plants with Similar Names on Truk and Pingelap

11 cultivated food plants
1 cultivated ornamental
1 tree, medicinal, probably cultivated
1 shrub, cultivated ornamental or native
1 timber tree, probably cultivated
6 indigenous
1 shrub, native or cultivated, an economic fiber plant

22 total (out of the 46 species in common)

Degree of Similarity: Four, or 18 per cent, with identical names. Three of these are cultivated food plants. Eighteen, or 82 per cent, with altered names. Of these names, 4 (or 22 per cent) are much modified.

The island of Ponape is fairly close, lying 168 miles to the northwest by west.

Plants with Similar Names on Ponape and Pingelap

10 cultivated food plants
1 timber tree, probably cultivated
1 tree, fish poison, probably introduced
1 tree, food plant and ornamental, introduced
1 tree, food plant and medicinal, probably introduced
11 indigenous

25 total (out of the 40 species in common)

Degree of Similarity: Six, or 24 per cent, with identical names. These contain 4 cultivated food plants, 1 fish poison, 1 indigenous tree. Nineteen, or 76 per cent, with altered names. Of these, 1 (or 5 per cent) is much modified.

Comparison of these data indicates that the Pingelap plant names have most in common with those of Ponape. There are 25 plants in common with similar vernacular names; of these, 6 are identical, and of the 19 modified names, 18 are but slightly modified. There are 11 indigenous plants in the list, twice the number for any other island or group. Even these identities are small, as 34 of the Pingelap plants have different names, yet the resemblances are strongest between these two islands. It seems evident that the vocabulary of Pingelap, though quite distinct, has a small but definite similarity to that of Ponape.

Trukese is next in affinity, there being 22 plants with names in common. But, it is seen that only 6 are certainly indigenous, that only 4 (or 18 per cent) have precisely identical names, and that among the list of altered names about 22 per cent are much modified.

The Marshall Islands have little claim to a close relationship, as the number of related plant names is small, only 13. Of these, only 3 are indigenous plants, and 70 per cent of the names are altered. Of these, 23 per cent are much modified.

In Kusaie, of the plants in common, 33.3 per cent have identical names, but the grand total is only 12 species and varieties. Eight of the names are much modified. The total of 12 species and varieties is so small that the high percentage of identities, based on only three species, is not significant.

All in all, comparisons of these Pingelap plant names indicate that the vocabulary of Pingelap, at least in these names for common objects, shows some affinities to that of Ponape. With the other surrounding islands—Truk, Kusaie, and the Marshalls—the words in common are few and the affinities slight.

CATALOGUE OF THE FLORA OF PINGELAP

The specimens were all collected by H. St. John on December 27, 1945. The vernacular Pingelap name is given in quotation marks, followed by the author's collection number for the species. The names of indigenous species are printed in bold roman type, while those of adventives and cultivated plants are in bold italics.

POLYPODIACEAE

1. **Asplenium nidus** L.

"Seilik," *21,477.* Occasional, epiphyte on moist tree trunks.

2. **Nephrolepis biserrata** (Sw.) Schott

"Puĕs," *21,484.* On ground or tree trunks, in moist forest.

3. **Polypodium Phymatodes** L.

"Kĭtiu," *21,479.* Common on ground or trees.

4. **Vittaria elongata** Sw.

"Lĭt," *21,466.* On mossy bases of coconut trunks, in moist woods. A common fern of the tropical Pacific, occurring from Africa, India, Burma, Malaya, and on the high islands from Sumatra and the Philippines through Malaysia and Australia, and Polynesia to the Marquesas. Apparently this collection is the first to be reported for the species on an atoll or a low coral island. No such record was known to Wagner (1945: 74–76), though on page 76 he reported it on Guam, with five other fern species on a coconut trunk "in a shady bushy location on the wooded side of a limestone hill."

PANDANACEAE

5. **Pandanus** sp.

"Kipai." One kind was collected, but unfortunately it was lost on the airplane trip back to Honolulu. *Pandanus* trees of good size were common both on the beaches and in the interior. They are important to the inhabitants, furnishing edible fruit, timber from the trunks, and thatch from the leaves. My native informant, Soăs, could not remember all, but furnished the names of the following species or kinds:

(1) "Asibuirĕk"
(2) "Nanagaisal"
(3) "Sŏnumei"
(4) "Nanagasăk"
(5) "Aisĕsewil"
(6) "Maukosŏkosŏk"
(7) "Muisamuis"
(8) "Esiĕs"
(9) "Suioibueibuei"
(10) "Arawa-an," or "Arawan"
(11) "Muisigĕl"
(12) "Meikĭlikĭl"
(13) "Luaramŭk"
(14) "Tobodĭn"

No. (1) resembles the varietal names "Ajbirik" of Ailuk Atoll, "Ajibuiruk" of Majuro Atoll, and "Agiwirok" of Jaluit Atoll in the Marshall Islands. No. (10) resembles "Eruan" of Ailuk Atoll, Utirik Atoll, Mejit Island, Majuro Atoll, Namu Atoll, Jaluit Atoll, and Likiep Atoll, and "Erwan" of Wotje Atoll, and Jaluit Atoll. No. (13) resembles "Loarmai" of Ebon Atoll. No. (14) resembles "Tibitin" of Majuro Atoll, and "Tabatin" or "Tabawdin" of Ebon Atoll.

HYDROCHARITACEAE

6. **Thalassia Hemprichii** (Ehrenb.) Aschers.
"Walăt," *21,458*. Small plants in sand, submerged in shallow sea water off outer beach. The young plants were sterile, but by examination of the foliar anatomy, identification was reasonably certain.

GRAMINEAE

7. **Eragrostis amabilis** (L.) Wight & Arn.
"Rosakai." Not collected, but observed.

8. **Lepturus repens** R. Br.
"Rosakai" (the name of any grass or grass-like plant). Observed, but not collected.

9. ***Saccharum officinarum*** L.—Cultivated.
"Seu." Observed, but not collected. Small clumps were grown by the huts or houses in the village, and occasional plants were seen in the extensive wet field or "lepuel" for *Cyrtosperma* culture. The vernacular names of the five cultivated varieties were:
(1) "Kala"
(2) "Sowesasa"
(3) "Palau"
(4) "Teimos"
(5) "Ieseng"

10. **Thuarea involuta** (Forst. f.) R. & S.
"Mokarăk," *21,465*. Repent on sands near beach.

CYPERACEAE

11. **Cyperus javanicus** Houtt.
"Săpasăp," *21,471*. Edge of fresh swamp. Used to perfume coconut oil.

12. **Fimbristylis cymosa** R. Br.
"Rosakai," *21,491*. In woods by lagoon beach.

PALMAE

13. ***Cocos nucifera*** L.—Cultivated and spontaneous.
"Ni." Observed, but not collected, abundant. Various growth stages of the nut are named, as:
"Pĕn," the drinking nut, or two-thirds grown
"Arĭng," the ripe nut
"Par," the sprouted nut

ARACEAE

14. ***Colocasia esculenta*** (L.) Schott var. ***antiquorum*** (Schott) Hubb. & Rehd.—Cultivated.
"Sawa." Observed, but not collected. A few plants were seen, but they were grown in the *Cyrtosperma* "lepuel" almost as specimens. It is a crop of very minor importance. The seven following varieties were distinguished by name:
(1) "Bokor"
(2) "Tawăng" [?Taiwan]
(3) "Mesawsŏl"
(4) "Koso"
(5) "Sawa Pingelap"
(6) "Sauk"
(7) "Pemeru"

15. ***Cyrtosperma Chamissonis*** (Schott) Merr.—Cultivated.
"Muiăng." Observed, but not collected. The most important food crop. Near the center of the island was a large swamp that possibly had been enlarged by digging. It seemed to be 300 feet wide and more than 600 feet

long. Within this low, wet garden, or "lepuel," each family controlled a plot and each year fertilized it with leaves and trash. The "lepuel" was thickly planted to "Muiăng." The natives reported that the crop matured in 3 years, but could be harvested any time after 1 year. If allowed to grow to maturity, the corm attained large size, as much as 2 m. in length and 6 dm. in diameter and a weight so heavy that two men were needed to carry it. Five varieties were cultivated, and were known by the following vernacular names:

(1) "Muiăng An Ngatĭk"
(2) "Muiăn Sdŏntŏl"
(3) "Nane Pakĕleman"
(4) "Sĭmidĭn"
(5) "Sĕrisĕng"

The name of No. (1) refers to Ngatik Island, a coral island 200 miles westward of Pingelap.

AMARYLLIDACEAE

16. ***Crinum asiaticum*** L.—Cultivated.
"Kiĕp." Observed, not collected. Seen only as a cultivated plant in the village.

17. ***Zephyranthes rosea*** (Spreng.) Lindl.—Cultivated.
"Kiĕp." An ornamental, by the houses; observed, not collected.

TACCACEAE

18. ***Tacca Leontopetaloides*** (L.) Ktze.—Rev. Gen. Pl. 704, 1891.
Leontice Leontopetaloides L., Sp. Pl. 313, 1753.
T. pinnatifida Forst., Char. Gen. 70, t. 35, 1776.
"Mŭgamuk," *21,480.* Cultivated and spontaneous. Commonly planted, also persisting and spreading in the woods, abundant. Stem fibers used in plaiting hats. The tubers are an important source of starchy food. They are grated, the pulp washed in three changes of sea water, washed in fresh water, then discarded. The starch which accumulates as a sediment is dried and preserved for use as food.

DIOSCOREACEAE

19. ***Dioscorea ?korrorensis*** R. Knuth
"Kĕp," *21,481.* Cultivated in village, the stems climbing on a tree. Tuber edible, said to attain a maximum size of 1 m. in length, and 3 dm. in diameter. The plant was sterile, but the vegetative parts match well those of *D. korrorensis.*

MUSACEAE

20. ***Musa paradisiaca*** L.—Cultivated in village and in the wet "lepuel."
"Wis." Numerous plants were seen and they were vigorous and productive. They represented both the subsp. *normalis* Ktze. and the subsp. *sapientum* (L.) Ktze., and included the following named varieties:

(1) "Latin"
(2) "Amerika"
(3) "Usigaras"
(4) "Iyeman"
(5) "Lakatăn"
(6) "Taiwan"
(7) "Kŭtkŭt"
(8) "Panilo"
(9) "Manila"
(10) "Wuseăk"

Obviously Nos. (2), (3), and (9) bear names indicating foreign origin, and perhaps No. (1) does also. No. (5) is the vernacular name on Jaluit Atoll for *Pandanus Lakatwa* Kanehira. No. (2) is reported by Lt. Comdr. S. H. Elbert in his Trukese dictionary to be the "Lady Finger" variety.

PIPERACEAE

21. Peperomia ponapensis C. DC.
"Warĭn," *21,475.* On coral stone wall in moist forest, near lagoon beach. Medicinal,

the pounded, fleshy leaves being used as a poultice for boils. Few of the Pacific atolls support *Peperomia,* so this locality record is noteworthy.

The specimen was submitted to and identified by Dr. T. G. Yuncker as *P. ponapensis.* The collector had also studied this species, deciding that it was the most similar one, but that the plants from Pingelap differed in having the leaves averaging smaller, mostly not 3–5 cm. long; and the fruit smaller, 0.5–0.6 mm. in diameter. These differences are still evident, but in a genus with so many microspecies, he has no desire to add another, so accepts the determination as *P. ponapensis.* Ponape is an adjacent high island, lying 168 miles west by north.

MORACEAE

22. ***Artocarpus incisus*** (Thunb.) L. f., Suppl. 411, 1781. Cultivated.

Rademachia incisa Thunb., Vet. Akad. Stockholm, Handl. 37: 254, 1776.

A. communis Forst., Char. Gen. 101, 1776.

Sitodium-altile Parkinson, Jour. Voy. Endeavour 45, 1773.

A. altilis (Parkinson) Fosberg, Wash. Acad. Sci., Jour. 31: 95, 1941.

"Mai." Observed, but not collected. Abundant and vigorous, the trees attaining a height of 20 m. or more.

Variety with Seed-bearing Fruit:

(1) "Mei sabarĕk"

Varieties with Seedless Fruit:

(1) "Meipa"

(2) "Mei si"

There is confusion concerning the binomial for the breadfruit, and it is not asserted that these words will settle it, but they are given in justification of the name adopted. *Rademachia incisa* Thunb., published in 1776, was little used, while *Artocarpus communis* Forst. of 1776 provided the accepted generic name and the combination *Artocarpus incisus* (Thunb.) L. f., made in 1781, furnished the binomial that won almost universal acceptance (as *A. incisa*) for more than a century. Then Merrill (1906: 43) readopted *A. communis* Forst., listing *A. incisa* (Thunb.) L. f. as a synonym. In several later publications he continued this usage, without giving an interpretation, but he apparently preferred *communis* because it was published in the genus *Artocarpus.* The International Rules of Botanical Nomenclature of that date or of this current date do not include a rule validating this choice, while Art. 4 and 5 apply, as in cases of doubt, authorizing the following of established custom, as in this case, the choice of *A. incisus* (or *incisa*). A final basis would be that of strict priority, but no one has yet been able to establish the exact dates within the year 1776 for the two publications by Thunberg and by Forster. If bibliographic research can establish the exact dates, this matter will be finally settled.

Another detail in question is that of the gender of the generic name *Artocarpus.* The name was published by Forster (1776: 101–102, t. 51, 51a) and the two Greek roots were given—*artos,* bread, and *karpos,* fruit —from which the name was derived. The single species *A. communis* was listed, but with no clear indication of the gender. The termination *us* would ordinarily be masculine, but the practice of making genera feminine was so general, especially with trees, that one cannot now be certain that the Forsters decided to make the genus masculine. The specific name they used, *communis,* is either masculine or feminine. There is no other evidence in the Forster book, in the index or text, that gives any indication. Corner states (1939: 282) that Forster subsequently used *A. incisus,* but the writer notes that G. Forster changed to *A. incisa* F. (=Forst. f.) (1786: 23), though he should have credited the combination to L. f. or at least to L. f. emend. Forst. f., as based on a change of gender.

The two simultaneously published genera and binomials, *Rademachia incisa* Thunb. and *Artocarpus communis* Forst., were first united in 1781 by the younger Linnaeus (Linné, 1781: 411–412). His choice, which we must accept as final (Int. Rules, Art. 56), was the genus *Artocarpus.* Though this generic name was adopted from the Forsters, he chose the specific name from Thunberg and the present International Rules validate such a choice. Since he was the next author to publish a specific name in the genus *Artocarpus,* he also could determine the gender of the name. He used the form *Artocarpus incisus* (Thunb.) L. f., which would have been decisive, establishing the generic name as masculine, had he not for the second species used the feminine one *A. integrifolia* L. f., which he coined anew for *Rademachia integra* Thunb., a substitution now illegal, but which indicated his use of a conflicting gender. Thus, the younger Linnaeus only added new confusion to the problem of the gender of the name.

The next author to publish on *Artocarpus* appears to have been Lamarck (1789:207–210), who treats the genus in detail, including five species, three of them new. Of the five names, *A. Philippensis* is either masculine or feminine; *A. jaca* (=*A. Jaca*) is a name based both on the generic name *Jaca* and the vernacular name "Jak," so it does not truly indicate the gender, but the three other specific names, *incisa, heterophylla,* and *hirsuta,* are all feminine, so this choice by Lamarck, perhaps following G. Forster's second usage, may be accepted as determining the gender of the generic name, and nearly all subsequent botanists did so accept it. It so stood until 1935 when the third International Rules of Botanical Nomenclature included a new mandatory rule, 72(2), applying to the gender of generic names: "... all other modern compounds ending in the Greek masculine *carpos* (or *carpus*) are masculine." This rule changes the gender of *Artocarpus* to masculine. It is so used by Corner (1939:280) but he does not discuss the gender and he also uses the feminine name *A. integrifolia* L. f., as he did in his earlier paper in the same journal (1939: 71, 80).

It does not seem to be generally realized that *Artocarpus* is now established as a masculine genus, and the name for breadfruit is *A. incisus* (Thunb.) L. f. The writer is fully aware of the name *A. altilis* (Parkinson) Fosberg, based on the earliest name for the breadfruit, *Sitodium-altile* Parkinson, but the validity of this name is still in doubt, and even Fosberg himself has proposed (1939:230–231) that *Sitodium* be made a rejected name and *Artocarpus* a conserved name. The issue is much involved, so for the time being, the long-established name *Artocarpus incisus* (Thunb.) L. f. will be retained for the breadfruit tree.

23. **Ficus** sp.
"Kawain," *21,464.* Young tree, 3 m. tall. Fruit cooked and eaten; bark fiber used for fish line. Probably indigenous.

URTICACEAE

24. ***Pilea microphylla*** (L.) Liebm.—Adventive weed.
"Re." Observed, but not collected. Common in village on stone walls and foundations.

25. **Pipturus argenteus** (Forst. f.) Wedd.
"Oroma," *21,486.* In woods. Tree 8 m. tall, by 2 dm. in diameter. The bast fiber is used for making fish nets.

NYCTAGINACEAE

26. **Ceodes umbellifera** J. R. & G. Forst.
"Mas," *21,487.* Tree 10 m. tall, by 3 dm. in diameter, in the village. There is an islet in the Ulithi Atoll named Mas Island.

27. ***Mirabilis Jalapa*** L.—Cultivated.
"Pesikulŏk." Observed, but not collected. An ornamental, commonly cultivated in the village.

CRASSULACEAE

8. ***Bryophyllum pinnatum*** (Lam.) Kurz — Cultivated.
"Lămalăm," *21,482.* Ornamental, introduced by the Germans. Found by village street. The vernacular name may be geographic, alluding to the Lamaram Islands, lying 120 miles west by north.

LEGUMINOSAE

9. **Derris trifoliata** Lour.
"Kainipĭl," *21,470.* Vine, climbing on trees near beach.

10. **Vigna marina** (Burm.) Merr.
"Nimĕlitŏp," *21,460.* Vine, trailing or climbing, top of beach.

EUPHORBIACEAE

11. ***Acalypha grandis*** Benth. var. ***genuina*** Muell. Arg.—Cultivated.
"Kurulŏng." Observed, not collected. An ornamental, grown in the village beside the houses or as a hedge plant, introduced during the German rule.

12. **Euphorbia Atoto** Forst.
"Pĕlepĕl," *21,467.* Tufted, erect; leaves glaucous beneath. In grassy thicket.

13. **Phyllanthus Niruri** L.
"Limaimeir," *21,485.* Common in open places or in forest. Medicinal, used for treating dysentery.

SAPINDACEAE

14. **Allophylus timorensis** (DC.) Bl.
"Kĭtăk," *21,478.* Young tree, 7 m. tall, the flowers white.

TILIACEAE

15. **Triumfetta procumbens** Forst. f.
"Konŏp," *21,476.* Trailing on sand in open woods. The flexible stems provide a firm, shiny fiber much used, when dyed, in plaiting belts, mats, etc.

MALVACEAE

16. ***Sida fallax*** Walp.—Cultivated in village.
"Kao," *21,456.* Shrub 2 m. tall.

17. **Thespesia populnea** (L.) Soland.
"Pĕnne," *21,473.* Tree 8 m. tall, by 3 dm. in diameter; flowers fading red. By lagoon beach. Wood of good quality, used for ax handles, etc.; bark fiber used for making fish nets.

GUTTIFERAE

18. ***Calophyllum Inophyllum*** L.
"Sepang," *21,461.* Tree 15 m. tall, by 1 dm. in diameter. Top of beach, only a few trees seen, apparently introduced by the natives. Wood used for canoe hulls, etc. Fruit medicinal and a source of oil. The vernacular name may be geographic, referring to Saipan Island.

CARICACEAE

19. ***Carica Papaya*** L.—Cultivated.
"Kaineăp." Observed, not collected, common. The vernacular name resembles "Keinapu" of Namu, Likiep, Ailuk, Utirik, Mejit, Majuro, and Ebon in the Marshalls; and "Keinabu" in Aur Atoll.

LYTHRACEAE

20. **Pemphis acidula** Forst.
"Ka-i-ni," *21,474.* Tree 7 m. tall, by 2 dm. in diameter. On lagoon beach. Wood used for handles, pipes, etc.

SONNERATIACEAE

21. **Sonneratia alba** Sm.
"Kosa," *21,468.* Tree 8 m. tall, by 2 dm. in diameter, the roots with knees. A mangrove, growing in the shallow salt water of the lagoon. Wood good, used for tool handles.

LECYTHIDACEAE

22. ***Barringtonia asiatica*** (L.) Kurz
"Wi." Observed, but not collected. Probably introduced by the natives because of its value as a fish poison.

RHIZOPHORACEAE

43. **Rhizophora mucronata** Lam.
"Ăk," *21,469.* Tree 8 m. tall, by 3 dm. in diameter, with prop roots. A mangrove tree, growing in shallow salt water of lagoon. Good timber.

COMBRETACEAE

44. ***Terminalia Catappa*** L.—Cultivated.
"Tepŏp." Observed, but not collected.

45. **Terminalia litoralis** Seem.
"Wĭn," *21,459.* Tree 9 m. tall, by 7 dm. in diameter; flowers greenish; fruit 15–18 mm. long, ellipsoid, crimson, edible. Wood used for tool handles.

ONAGRACEAE

46. ***Jussiaea suffruticosa*** L. var. ***ligustrifolia*** (HBK.) Griseb.—Introduced weed.
"Kuri." Observed, but not collected. Seen growing in the low, wet *Cyrtosperma* patch.

APOCYNACEAE

47. **Plumeria acutifolia** Poir.—Cultivated.
"Po maria." This vernacular name for the introduced ornamental tree is clearly only the natives' method of pronouncing *Plumeria.*

ASCLEPIADACEAE

48. ***Asclepias curassavica*** L.—Introduced weed.
"Kimeme," *21,490.* In the village.

BORAGINACEAE

49. **Messerschmidia argentea** (L. f.) I. M. Johnston
"Sĕsĕn," *21,457.* Tree 8 m. tall, by 3 dm. in diameter, common.

VERBENACEAE

50. **Clerodendrum inerme** (L.) Gaertn.
"Ilau," *21,472.* Shrub, the arching branches 2–4 m. long. In forest near lagoon beach.

51. **Premna integrifolia** L.
"Sokŭk," *21,488.* Tree 8 m. tall, by 2 dm. in diameter; flowers white; fruit black. In moist woods.

ACANTHACEAE

52. ***Pseuderanthemum atropurpureum*** (Bull) Radlk.—Cultivated.
"Sarinairăm," *21,489.* Cultivated in village; introduced by the Germans. Shrubs 1–4 m. tall; flowers white, with rose-magenta spots in the throat.

RUBIACEAE

53. **Guettarda speciosa** L.
"Elĕs," *21,492.* Tree 7 m. tall, by 2 dm. in diameter. The logs used for canoe hulls. The white, fragrant flowers used as ornaments in the hair or used to perfume coconut oil.

54. ***Ixora carolinensis*** (Val.) Hosokawa, aff. var. ***typica*** Fosb.—Cultivated.
"Kalesu," *21,463.* Cultivated in the village as an ornamental. Shrub 5 m. tall. This does not match any of the several varieties described by Fosberg, but comes closest to the var. *typica.*

55. ***Morinda citrifolia*** L.—Growing away from the village, but apparently not native.
"Obul." Observed, but not collected. Though the fruit is bitter, slimy, and nauseating, the natives use it as an edible fruit and as a medicine.

GOODENIACEAE

56. **Scaevola frutescens** (Mill.) Krause
"Raměk," *21,462.* Shrub 8 m. tall, by 2 dm. in diameter; flowers white; fruit white.

COMPOSITAE

57. **Wedelia biflora** (L.) DC.
"Kĭsuwĕll," *21,483.* Half scandent shrub. In moist woods, common.

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